

**REMARKS:**

Claims 1-3 are in the case and presented for consideration.

The Examiner has rejected claims 1-3 under 35 U.S.C. §112, second paragraph for use of improper Markus group language. The Examiner's rejection is respectfully traversed, however since the claims are believed to be in proper form as now presented.

Claims 1-3 have also been rejected as being anticipated under 35 U.S.C. §102(b) from U.S. Patent 6,303,812 to Fifolt and as being obvious under 35 U.S.C. §103(a) from Published Patent Application US2002/0156337 to Jenson.

Claim 1 has been amended to be verbally simplified and to exclude any possible ambiguity. The following limitations have also been included over the previous version of Claim 1:

- The claimed method has been introduced as being "speedy and substantially complete" in the preamble to Claim 1. Support for this can be found in the present examples from which it clearly follows that the inventive method runs very promptly (in hours) and substantially completely (about 99%), namely in comparison with the corresponding methods of the prior art.

- The temperature range in which the invention method proceeds has been restricted to 250 to 500 °C. Support for this limitation could be found in that all the present examples, exclusive of that demonstrating the temperature dependence of the method efficiency, start with a working temperature not being less than 250 °C.

- The copper component has been restricted to a copper compound only. The

copper compound represents a preferred implementation over that using copper in metallic form, the latter being relatively more expensive. This limitation is supported by the present examples exclusively working with copper compounds (cupric oxide, cupric hydroxide, cuprous oxide).

- In the closing portion of Claim 1, the elemental copper has been introduced as "highly active." Support for this limitation can be found in the second complete paragraph of page 5 of the present application where the nascent form of copper is discussed. It is well known that this form of copper is highly reactive.

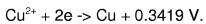
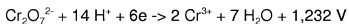
It is noted and stressed that the scope and meaning of each feature of Claim 1, in the framework of the method according to the present invention, is believed to be very clear to the person skilled in the art. To this end: "halogenated aromatic compound" is very clearly any aromatic compound comprising at least one halogen atom; "halogenated cyclic compound" is any cyclic compound comprising at least one halogen atom; "copper compound" is any compound comprising copper as a part of the molecule; "hydrogen donor" is comprehensible as a substance being able to provide hydrogen under processing conditions (please see the attached Internet extract from [www.scopus.com](http://www.scopus.com) evidencing that the meaning of the term "hydrogen-donor" as currently used in the technical literature); "carbon" is the known element; and the identity of the additional reducing substance capable of reducing cupric and cuprous ions to a highly reactive elemental copper (ARS) can be easily estimated from tabular values of ox-redox potentials and optionally experimentally simply determined by the person skilled in the art.

The crucial features making the method according to the invention novel and unobvious over the prior art is the use of the combination of carbon and the ARS or "additional reducing substance" of Claim 1 (see the specification at the introductory portion of the first complete paragraph of page 4 and the second complete paragraph of page 5, respectively, where the importance of both these substances is explained). This claimed requirement is not mentioned or hinted at in the prior art cited against the claims in the Final Action or previously.

In the following, the method as claimed in the newly redrafted Claim 1 will be compared to the methods disclosed in Fifolt and Jensen, as well as in the previously cited U.S. Patent 5,276,250 to Hagenmaier.

(1) The Claim 1 method vs. Hagenmaier:

(1a) The method of Hagenmaier does not use either carbon or ARS.  $\text{Cr}_2\text{O}_3$  can not be regarded as ARS since  $\text{Cr}_2\text{O}_3$  is not able to reduce the cupric and cuprous ions to the elemental copper as it clearly ensues, to the person skilled in the art, from the following tabular ox-redox potentials of the corresponding oxidation and reduction reactions (given, for instance, in CRC Handbook of Chemistry and Physics, David R. Lide, Ph.D., 80'th edition the relevant extract of which is attached):



As the method of Hagenmaier lacks two principle features of the method of the present application (and this absence does not contribute to ameliorate the dehalogenation process) the claims are novel over Hagenmaier.

(1b) Hagenmaier also does not mention or hint that the dehalogenation process would proceed considerably better when the system  $\text{CuO/Cr}_2\text{O}_3$  would be completed with carbon and ARS (and a hydrogen donor, too) as a result of which it is clear that the method of the present application could not have been obviously derived from Hagenmaier and should be therefore considered unobvious over Hagenmaier.

(2) The Claim 1 method vs. Fifolt:

(2a) The method of Fifolt exclusively uses the elemental copper (copper powder) as copper component which is, on the contrary, not used according to the newly presented Claim 1. Fifolt does not use either carbon or the hydrogen donor which are, on the contrary, are required in the method according to the present application. The method of Fifolt proceeds at a temperature from about 100 to about 200 °C which range does not overlap with the newly amended temperature range of from 250 to 500 °C. Nowhere in Fifolt is it mentioned or hinted that the process of Fifolt is or has to be implemented in a closed system as a result of which the process of Fifolt must be regarded as a process not implemented in a closed system.

The Applicant strongly disagrees with the Examiner's affirmation that "the process of Fifolt could be considered to occur in a closed system according to the broadest reasonable interpretation of the claims." There is no support what so even in Fifolt to

suggest a closed system according to any reading of the reference. The broadest reasonable interpretation of the claims is clearly limited to a closed system, however, as literally stated in the language of Claim 1.

From the text of Fifolt it is clear that a closed system is not a feature of the process according to Fifolt. In contrast to this, the work in the closed system is the obligatory feature of the method of the present application.

All these differences clearly evidence in favor of novelty of the method according to the present application in view of the method and teaching of Fifolt.

(2b) One of the crucial characteristics of the method according to the present application is a combination of the following substantial features: carbon and the closed system promoting the creation of the beneficial reductive atmosphere in the system (as explained at the beginning of the first complete paragraph of page 4 of the description of the present application). Since none of these features is either mentioned or hinted in Fifolt, it is clear that the method according to the present application could not have been obviously derived from Fifolt so that the method according to present application is believed to be unobvious over Fifolt.

### (3) The Claim 1 method vs. Jensen:

(3a) Nowhere in Jensen is there mentioned a combination of copper component with ferrous iron. If a copper component is there used in combination with an iron component, it is only in the form of a metal couple comprising of iron/copper powder. As to the ferrous iron itself, this is in fact used in another separate combination only comprised

of ferrous and ferric iron (see paragraphs 11, 22, 50 of Jensen ). Ferrous iron can not be thus regarded as ARS in the sense of the method according to the present application. In addition the method according to the newly drafted Claim 1 does not use elemental copper. Neither the presence of carbon in combination with the copper component is mentioned anywhere in Jensen. Carbon is mentioned in Jensen only as a support for Pt, Pd or Rh. Paragraph 74 of Jensen clearly states that "the present method will be [rather than may be] operated at a wide range of temperatures ranging from 0°C to 100°C, where ambient temperature is preferred" (emphasis added). The temperature scope of the process of Jensen is thus clearly delimited. Another interpretation should be considered incorrect, speculative and purposely aimed against the patentability of the method according to the present application. All the implementation examples in Jensen actually run at a temperature close to the ambient. All the above differences evidence in favor of the novelty of the method according to the present application in view of Jensen.

(3b) As Jensen does not in fact mention or use either ARS, carbon, a hydrogen donor or a temperature range of 250 to 500°C in combination with copper compound, it is clear that the method according to the present application could not have been obviously derived from Jensen. As a result of the absence of these features in the method of Jensen, the method according to the present application is superior (dehalogenation during several hours) to that of Jensen as well, and therefore produces an unexpected and advantageous result.

Claim 1, as well as Claims 2 and 3 that further distinguish the invention, are also unobvious over any combination of Hagenmaier, Fifolt and Jensen.

The new principle of the method of the present application is the implementation of the concerned dehalogenation by copper component in the presence of the combination of ARS and carbon in a closed system. As the presence of carbon in said combination is not mentioned in anyone of the documents Hagenmaier, Fifolt and Jensen, the new principle could not have been obviously derived either from separate Hagenmaier, Fifolt or Jensen references, or from any combination thereof. Thus the method according the present application should be considered unobvious over the combination of Hagenmaier, Fifolt and Jensen.

Accordingly, the application and claims are believed to be in condition for allowance, and favorable action is respectfully requested.

No new matter has been added.

If any issues remain, the Examiner is respectfully invited to contact the undersigned at the number below, to advance the application to allowance.

Respectfully submitted,  
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